PATENT

Attorney Docket No.: 6056-279

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re:	Patent application of Clara Fronticelli	:	Group Art Unit:
Serial No.:	09/787,216	:	
Filed:	March 14, 2001	:	Examiner:
For:	Polymeric Hemoglobins Mutants	:	

STATEMENT PURSUANT TO 37 CFR § 1.8259(a)(b)

Commissioner for Patents
Box PCT
Washington, D.C. 20231

Sir:

The Substitute Sequence Listing filed herewith includes no new matter. The content of the substitute Sequence Listing in computer readable form is the same as the substitute paper copy of the Sequence Listing submitted herewith.

CERTIFICATE OF MAILING UNDER 37 C.F.R. 1.10

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Sally Hoffman
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Sally Hoffman
Type or print name of person

Respectfully submitted,

CLARA FRONTICELLI

BY _____

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RAW SEQUENCE LISTING DATE: 12/09/2002
PATENT APPLICATION: **US/09/787,216A** TIME: 11:48:47

Input Set : **N:\Crf3\RULE60\09787216A.RAW**
Output Set: **N:\CRF4\12092002\I787216A.raw**

ENTERED

<110> APPLICANT: Fronticelli, Clara
<120> TITLE OF INVENTION: POLYMERIC HEMOGLOBIN MUTANTS
<130> FILE REFERENCE: 6056-279 PC
<140> CURRENT APPLICATION NUMBER: 09/787,216A
<141> CURRENT FILING DATE: 2002-09-20
<150> PRIOR APPLICATION NUMBER: PCT/US99/22756
<151> PRIOR FILING DATE: 1999-09-30
<150> PRIOR APPLICATION NUMBER: 60/102,640
<151> PRIOR FILING DATE: 1998-10-01
<160> NUMBER OF SEQ ID NOS: 12
<170> SOFTWARE: PatentIn Ver. 2.0
<210> SEQ ID NO: 1
<211> LENGTH: 438
<212> TYPE: DNA
<213> ORGANISM: Human
<400> SEQUENCE: 1

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gatgaagttg gtggtgaggc cctgggcagg ctgctggtgg tctacccttg gacccagagg 120
ttctttgagt cctttgggga tctgtccact cctgatgctg ttatgggcaa ccctaaggtg 180
aaggctcatg gcaagaaagt gctcggtgcc tttagtgatg gcctggctca cctggacaac 240
ctcaagggca cctttgccac actgagtgag ctgcactgtg acaagctgca cgtggatcct 300
gagaacttca ggctcctggg caacgtgctg gtctgtgtgc tggcccatca ctttggcaaa 360
gaattcaccc caccagtgca ggctgcctat cagaaagtgg tggctggtgt ggctaatgcc 420
ctggcccaca agtatcac 438

<210> SEQ ID NO: 2
<211> LENGTH: 438
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Description of Artificial Sequence: Mutant of human beta-globin
<400> SEQUENCE: 2

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ttctttgagt cctttgggga tctgtccact cctgatgctg ttatgggcaa ccctaaggtg 180
aaggctcatg gcaagaaagt gctcggtgcc tttagtgatg gcctggctca cctggacaac 240
ctcaagggca cctttgccac actgagtgag ctgcatgctg acaagctgca cgtggatcct 300
gagaacttca ggctcctggg caacgtgctg gtcggtgtgc tggcccatca ctttggcaaa 360
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ctggcccaca agtatcac 438

<210> SEQ ID NO: 3
<211> LENGTH: 146
<212> TYPE: PRT

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<213> ORGANISM: Human
<400> SEQUENCE: 3

```
Val His Leu Thr Pro Glu Glu Lys Ser Ala Val Thr Ala Leu Trp Gly
 1               5                  10                  15
Lys Val Asn Val Asp Glu Val Gly Gly Glu Ala Leu Gly Arg Leu Leu
            20                  25                  30
Val Val Tyr Pro Trp Thr Gln Arg Phe Phe Glu Ser Phe Gly Asp Leu
        35                  40                  45
Ser Thr Pro Asp Ala Val Met Gly Asn Pro Lys Val Lys Ala His Gly
    50                  55                  60
Lys Lys Val Leu Gly Ala Phe Ser Asp Gly Leu Ala His Leu Asp Asn
65                  70                  75                  80
Leu Lys Gly Thr Phe Ala Thr Leu Ser Glu Leu His Cys Asp Lys Leu
                85                  90                  95
His Val Asp Pro Glu Asn Phe Arg Leu Leu Gly Asn Val Leu Val Cys
            100                 105                 110
Val Leu Ala His His Phe Gly Lys Glu Phe Thr Pro Pro Val Gln Ala
        115                 120                 125
Ala Tyr Gln Lys Val Val Ala Gly Val Ala Asn Ala Leu Ala His Lys
    130                 135                 140
Tyr His
145
```

<210> SEQ ID NO: 4
<211> LENGTH: 146
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Description of Artificial Sequence: Mutant of human beta-globin
<400> SEQUENCE: 4

```
Val His Leu Thr Pro Glu Glu Lys Cys Ala Val Thr Ala Leu Trp Gly
 1               5                  10                  15
Lys Val Asn Val Asp Glu Val Gly Gly Glu Ala Leu Gly Arg Leu Leu
            20                  25                  30
Val Val Tyr Pro Trp Thr Gln Arg Phe Phe Glu Ser Phe Gly Asp Leu
        35                  40                  45
Ser Thr Pro Asp Ala Val Met Gly Asn Pro Lys Val Lys Ala His Gly
    50                  55                  60
Lys Lys Val Leu Gly Ala Phe Ser Asp Gly Leu Ala His Leu Asp Asn
65                  70                  75                  80
Leu Lys Gly Thr Phe Ala Thr Leu Ser Glu Leu His Ala Asp Lys Leu
                85                  90                  95
His Val Asp Pro Glu Asn Phe Arg Leu Leu Gly Asn Val Leu Val Gly
            100                 105                 110
Val Leu Ala His His Phe Gly Lys Glu Phe Thr Pro Pro Val Gln Ala
        115                 120                 125
Ala Tyr Gln Lys Val Val Ala Gly Val Ala Asn Ala Leu Ala His Lys
    130                 135                 140
Tyr His
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99       145
101 <210> SEQ ID NO: 5
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103 <212> TYPE: PRT
104 <213> ORGANISM: Human
105 <400> SEQUENCE: 5
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107         1               5                  10                  15
108       Val Gly Ala His Ala Gly Glu Tyr Gly Ala Glu Ala Leu Glu Arg Met
109                    20                  25                  30
110       Phe Leu Ser Phe Pro Thr Thr Lys Thr Tyr Phe Pro His Phe Asp Leu
111                35                  40                  45
112       Ser His Gly Ser Ala Gln Val Lys Gly His Gly Lys Lys Val Ala Asp
113             50                  55                  60
114       Ala Leu Thr Asn Ala Val Ala His Val Asp Asp Met Pro Asn Ala Leu
115        65                  70                  75                  80
116       Ser Ala Leu Ser Asp Leu His Ala His Lys Leu Arg Val Asp Pro Val
117                         85                  90                  95
118       Asn Phe Lys Leu Leu Ser His Cys Leu Leu Val Thr Leu Ala Ala His
119                    100                 105                 110
120       Leu Pro Ala Glu Phe Thr Pro Ala Val His Ala Ser Leu Asp Lys Phe
121                115                 120                 125
122       Leu Ala Ser Val Ser Thr Val Leu Thr Ser Lys Tyr Arg
123             130                 135                 140
125 <210> SEQ ID NO: 6
126 <211> LENGTH: 141
127 <212> TYPE: PRT
128 <213> ORGANISM: Artificial Sequence
129 <220> FEATURE:
130 <223> OTHER INFORMATION: Description of Artificial Sequence: Mutant of
131       human alpha-globin
132 <400> SEQUENCE: 6
133       Val Leu Ser Pro Ala Asp Lys Thr Asn Val Lys Ala Ala Trp Gly Lys
134         1               5                  10                  15
135       Val Gly Ala His Ala Gly Glu Tyr Gly Ala Glu Ala Leu Glu Arg Met
136                    20                  25                  30
137       Phe Leu Ser Phe Pro Thr Thr Lys Thr Tyr Phe Pro His Phe Asp Leu
138                35                  40                  45
139       Ser His Gly Ser Ala Gln Val Lys Gly His Gly Lys Lys Val Ala Asp
140             50                  55                  60
141       Ala Leu Thr Asn Ala Val Ala His Val Asp Asp Met Pro Asn Ala Leu
142        65                  70                  75                  80
143       Ser Ala Leu Ser Asp Leu His Ala His Lys Leu Arg Val Asp Pro Val
144                         85                  90                  95
145       Asn Phe Lys Leu Leu Ser His Ser Leu Leu Val Thr Leu Ala Ala His
146                    100                 105                 110
147       Leu Pro Ala Glu Phe Thr Pro Ala Val His Ala Ser Leu Asp Lys Phe
148                115                 120                 125
149       Leu Ala Ser Val Ser Thr Val Leu Thr Ser Lys Tyr Arg
```

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152 <210> SEQ ID NO: 7
153 <211> LENGTH: 423
154 <212> TYPE: DNA
155 <213> ORGANISM: Artificial Sequence
156 <220> FEATURE:
157 <223> OTHER INFORMATION: Description of Artificial Sequence: Mutant of
158       human alpha-globin
159 <400> SEQUENCE: 7
160       gtgctgtctc ctgccgacaa gaccaacgtc aaggccgcct ggggcaaggt tggcgcgcac 60
161       gctggcgagt atggtgcgga ggccctggag aggatgttcc tgtccttccc caccaccaag 120
162       acctacttcc cgcacttcga cctgagccac ggctctgccc aggttaaggg ccacggcaag 180
163       aaggtggccg acgcgctgac caacgccgtg gcgcacgtgg acgacatgcc caacgcgctg 240
164       tccgccctga gcgacctgca cgcgcacaag cttcgggtgg acccggtcaa cttcaagctc 300
165       ctaagccact ccctgctggt gaccctggcc gcccacctcc ccgccgagtt cacccctgcg 360
166       gtgcacgcct ccctggacaa gttcctggct tctgtgagca ccgtgctgac ctccaaatac 420
167       cgt                                                              423
169 <210> SEQ ID NO: 8
170 <211> LENGTH: 4
171 <212> TYPE: PRT
172 <213> ORGANISM: Artificial Sequence
173 <220> FEATURE:
174 <223> OTHER INFORMATION: Description of Artificial Sequence: Factor Xa
175       recognition sequence
176 <400> SEQUENCE: 8
177       Ile Glu Gly Arg
178         1
180 <210> SEQ ID NO: 9
181 <211> LENGTH: 27
182 <212> TYPE: DNA
183 <213> ORGANISM: Artificial Sequence
184 <220> FEATURE:
185 <223> OTHER INFORMATION: Description of Artificial Sequence: Mutagenizing
186       oligonucleotide for human beta-globin Ser9- Cys
187       mutation
188 <400> SEQUENCE: 9
189       ggcagtaacg gcgcacttct cctcagg                                     27
191 <210> SEQ ID NO: 10
192 <211> LENGTH: 27
193 <212> TYPE: DNA
194 <213> ORGANISM: Artificial Sequence
195 <220> FEATURE:
196 <223> OTHER INFORMATION: Description of Artificial Sequence: Mutagenizing
197       oligonucleotide for human beta-globin Cys93-Ala
198       mutation
199 <400> SEQUENCE: 10
200       tgcagcttgt cagcatgcag ctcactc                                     27
202 <210> SEQ ID NO: 11
203 <211> LENGTH: 18
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204 <212> TYPE: DNA
205 <213> ORGANISM: Artificial Sequence
206 <220> FEATURE:
207 <223> OTHER INFORMATION: Description of Artificial Sequence: Mutagenizing
208 oligonucleotide for human beta-globin Cys112-Gly
209 mutation
210 <400> SEQUENCE: 11
211 cagcacaccg accagcac 18
213 <210> SEQ ID NO: 12
214 <211> LENGTH: 423
215 <212> TYPE: DNA
216 <213> ORGANISM: Human
217 <400> SEQUENCE: 12
218 gtgctgtctc ctgccgacaa gaccaacgtc aaggccgcct ggggcaaggt tggcgcgcac 60
219 gctggcgagt atggtgcgga ggccctggag aggatgttcc tgtccttccc caccaccaag 120
220 acctacttcc cgcacttcga cctgagccac ggctctgccc aggttaaggg ccacggcaag 180
221 aaggtggccg acgcgctgac caacgccgtg gcgcacgtgg acgacatgcc caacgcgctg 240
222 tccgccctga gcgacctgca cgcgcacaag cttcgggtgg acccggtcaa cttcaagctc 300
223 ctaagccact gcctgctggt gaccctggcc gcccacctcc ccgccgagtt cacccctgcg 360
224 gtgcacgcct ccctggacaa gttcctggct tctgtgagca ccgtgctgac ctccaaatac 420
225 cgt 423

VERIFICATION SUMMARY DATE: 12/09/2002
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